Evaluation of Cleaning and Disinfection Effect of Washer-disinfector for Medical Instrument

I. Purpose
- More categories of reusable instrument, utensils and items are required of disinfection and sterilization in hospital. They are not easy to wash and disinfect after being contacted to organs, such as tissue fluid, body fluid and blood etc., which can directly influence sterilization effect, which is an important part of infection control. At present, we have the following cleaning methods, namely manual cleaning, ultrasonic cleaning, automatic washer-disinfector cleaning etc. But we are lack of relatively comprehensive and detailed evaluation method for cleaning and disinfection. We refer to YY/T 0734-2009 Washer-disinfector Part One: General Requirement, Term definition and Experiment as well as Disinfection Technical Standard(2002 version) to evaluate the cleaning and disinfection procedure of washer-disinfector, in order to provide reference for setting unified evaluation indicators.

II. Method

- Cleaning and Disinfection Efficiency Test
  - Cleaning and disinfection test for different contamination carrier.
  - Preparation of contamination carrier:
    - Took TSB to make 24h fresh stool coliforms diluted to certain concentration, respectively autoclaved 121℃ bacterial reiterates, then pipetted on 25 pieces of stainless steel paper, then tested for 24h, when the colonies grew, then put into 37℃ incubator for about 24h, making them debris for usage.
    - Medical instruments for contaminants loading. Spotted the cleaning and disinfection procedures of surgical instruments, made them debris completely. Used brush to paint sheep blood contaminant on the teeth and joints of hemostats, also painted on the surface and joints of tweezers. Placed them for 30 min.
    - Loading:
      - Rapid-A-520 washer-disinfector has four layers. Each plate can place 3 trays, which can be placed with 10 hemostats and 10 tweezers respectively. For the contaminant carrier, into the 5 locations of the tray on the basket, i.e. left inside, right inside, left outside, right outside and center area. Four carriers were on each layer. Respiratory anesthesia catheters were placed for one layer, and five carriers were placed there.
  - Disinfection:
    - After disinfection, put the contaminants into disinfection and then vibrated 200 times. After disinfection, inoculated sterile dish as Experimental Group Sample. Took 5 bacterial disinfection without disinfection put into disinfection and then vibrated 200 times. After disinfection, inoculated sterile dish as Positive Control Group. Took the same load of medium as Negative Control Group. Put Experimental Group Samples, Positive Control Group and Negative Control Group into 37℃ incubator for 48h. Repeated the test for 3 times.

III. Method

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IV. Result

- Protein residual detection result after different cleaning procedure.
- Three repeated test results indicate that among 30 surgical instruments, 30 humidification bottles, 30 glass and 30 respiratory anesthesia catheters on the sheaths, after the cleaning procedure of Rapid-A-520 washer-disinfector, absorbance value of residual protein contaminant is all below 0.020, with 100% pass rate.

- The residual protein detection result after the cleaning and disinfection procedure of Rapid-A-520 washer-disinfector can reduce the killing rate of MRSA, methicillin resistant Staphylococcus aureus, and MRSE, methicillin resistant Staphylococcus epidermidis.

V. Discussion

- For the detection of different kinds of washer-disinfector, we can refer to physical and chemical methods, e.g. the standards of moist disinfection AO value from YY/T 0734-2009 Washer-disinfector Part One: General Requirement, Term definition and Experiment. The condition is 80℃, 10min or 90℃, 3min and AO value is ≤600, the effect of moist disinfection can also be realized. If we process instrument contaminated by blood or lumen instrument, we can consider occult blood test or bacterial test. Therefore, we should consider various factors for different cleaning instruments, so as to evaluate cleaning and disinfection effect in an accurate and objective way.

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